DOCUMENT RESUME

ED 110 534 UD 015 338

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TITLE Is Differential Access to School an Important Factor in Student Outcomes? Report No. 195.
INSTITUTION Johns Hopkins Univ., Baltimore, Md. Center for the Study of Social Organization of Schools.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
REPORT NO CSOS-R-195
PUB DATE May 75
CONTRACT NE-C-00-3-0014
NOTE 35p.

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS *Academic Achievement; *Academic Aspiration; *Attendance; Educational Objectives; Educational Opportunities; Educational Resources; Elementary Schools; *National Surveys; School Environment; School Organization; *School Role; Secondary Schools; Statistical Analysis
IDENTIFIERS Equality of Educational Opportunity Survey

ABSTRACT

This paper explores whether differential access to school, as measured by student attendance, length of school day, and school term, is an important determinant of student outcomes (achievement and educational plans). It is stated here that most of the "school effects" research has utilized school level variables for school resources, assuming that each student benefits equally from these resources. One source of variation around these mean school values is simply the exposure that students have to these resources. This research it is held, attempts to incorporate such variation. Data from the Equality of Educational Opportunity survey for the sixth and twelfth grades and from a survey of 20 high schools were used. The latter data set made available both a student ability measure and attendance information drawn from school records (and not from student self-report data). The discussion first focuses on the school as the unit of analysis. In this discussion, some organizational features of the school which might influence attendance are examined. Later in the discussion, the individual student becomes the unit of analysis, and the technique of analysis of covariance is used to control for differential school level variables. Individual attendance then is viewed as a mediating variable between individual background factors, school factors, and achievement outcomes. (Author/JM)

IS DIFFERENTIAL ACCESS TO SCHOOL AN IMPORTANT FACTOR IN STUDENT OUTCOMES?

Contract No. NE-C-00-3-0014

Work Unit No. 2B

Nancy L. Karweit

Report No. 195

May 1975

The research reported herein was carried out at the Center for Social Organization of Schools, supported in part as a research and development center by funds from the United States National Institute of Education, Department of Health, Education and Welfare. The opinions expressed in this publication do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the Institute should be inferred.

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other then traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers program (formerly Careers and Curricula) bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the School Organization Program, examines the influence of school attendance on student achievement.

Abstract

This paper explores whether differential access to school, as measured by student attendance, length of school day, and school term, is an important determinant of student outcomes (achievement and educational plans). Research from the Coleman report onward has documented the small impact of differential school resources for achievement. However, as commonly noted, most of the "school effects" research has utilized school level variables for school resources, assuming that each student equally benefits from these resources. One source of variation around these mean school values is simply the exposure that students have to these resources. Incorporating such variation, we wished to see if differential access to schooling is an important factor for achievement.

Introduction

Since the publication of Equality of Educational Opportunity (Coleman, Campbell, et al., 1966), it has become commonplace to state that schools do not have much of a differential impact on the cognitive achievement of their students (Jencks, 1972). Phrased another way, the amount of the variance in achievement which may be attributed to schools is small in comparison to what is accounted for by characteristics of individual students within schools. Finding that differential facilities and school resources do not have much influence on students' achievement has not been accepted that easily, as the proliferation of re-analyses of the Coleman and Campbell report attest (e.g. Mosteller and Moynihan, 1972). Despite pleas for turning to more productive research endeavors (Hauser, Sewell, and Alwin, 1974), interest in assessing the effects of schools, however small these effects may be, has continued. Some of the interest has been maintained because schools are more amenable to change than individual student characteristics. Interest has also continued because the "no effects" hypothesis has been challenged on several grounds. For example, assigning average values of school facilities to each student in the school assumes that (a) each student has equal access to all resources, and (b) each student utilizes the available resources to the same degree(Heyns, 1974; Bowles & Levin, 1968).

The validity of these assumptions has correctly been challenged; what has been lacking is some means by which individual measures, not gross school measures of utilization might be employed. Unfortunately, we are unaware of any data set which incorporates measures of individual school resources. It would require an activity diary for each student, or a utilization log for each school resource to provide this sort of individualized data.

However, given that we lack such information on utilization, we can at least introduce individual variation around the average school value by determining the degree to which individual students have differential access to school resources. Access does not guarantee use, but access will set the upper and lower boundaries within which utilization can take place. In other words, we are attempting, albeit crudely, to determine if incorporating measures of variance of access to resources will alter the interpretation of "no" school effects.

This paper will explore the issue of whether or not differential access to school resources is an important determinant of achievement. Recent evidence (Wiley and Harnischfeger, 1974) has suggested the importance of quantity of exposure to schooling in determining achievement. Other evidence has pointed out the variability in individual school attendance rates (Karweit, 1973) and that differential exposure to schooling is conceivably a function of ethnic, class and other ascriptive characteristics (Children's Defense Fund, Children Out of School in America, 1974).

Using several data sources, in which exposure to schooling is operationalized by attendance rates, length of school term and hours in the school day, this paper will examine the impact of differential exposure on achievement.

Data and Methodology

Data from the Equality of Educational Opportunity survey for the sixth and twelfth grades (Coleman, Campbell, et al.) and from a survey of twenty high schools conducted and reported by McDill and his associates (McDill & Rigsby, 1973) will be used. The Equality of Educational Opportunity data

(EEO) was chosen in order to replicate and extend analyses carried out previously (Wiley and Harnischfeger, 1974; Heyns, 1973). The McDill data set was utilized because of the availability of a student ability measure and because attendance information was drawn from school records, not from student self-report data. An Appendix to this paper contains a description of the items used from each data set.

The discussion will, in the first section, focus on the school as the unit of analysis. In this section some organizational features of the school which might influence attendance are examined. In other sections, the individual student becomes the unit of analysis and the technique of analysis of covariance is used to control for differential school level variables. Individual attendance then is viewed as a mediating variable between individual background factors, school factors and achievement outcomes.

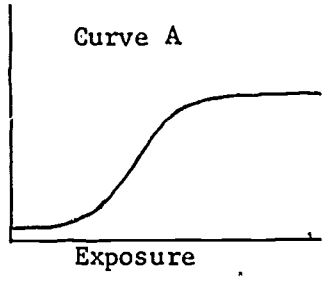
Background

In recent years little attention has been focused on the consequences of school absence for achievement. Perhaps some of this neglect is due to the fact that school attendance in the United States has increased steadily since 1869. In 1869 the average school term of 132.2 days was attended on the average 59.3 percent of the time. In 1969, the mean school term was 178.9 days long and was attended, on the average, some 90.4 percent of the time. However, since 1964 a slight downturn in attendance has been noticed. It is questioned if this decrease has been contributed to equally by all ethnic groups or uniformly across all geographic locations.

For example, large city school systems have had an appreciably lower attendance rate than their corresponding state or SMSA (Statistics of Large School Systems, 1972).

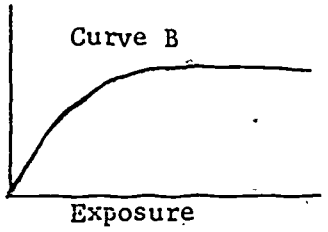
Even when the relationship between attendance and achievement has been addressed, the form of the relationship has seldom been considered. Torsten Husen (1972) has noted that "pedagogical folklore decrees that a 50 percent increase in formal schooling results in a corresponding increase in student achievement," (p. 32). This assumes that attendance and achievement are linearly related, but Husen further stated that students in rural Norway who received half-time instruction achieved only slightly below the group that was taught full-time. These results suggest that the linearity assumption is, at least in Norway, highly questionable. Let us consider briefly some plausible alternatives to the linearity assumption.

In the type of relationship shown by Curve A, there would be very little return in terms of achievement for small exposures to schooling. In the middle range, there would be a steep increment in achievement which would level off beyond a certain point. Being in school for only a small amount of time would be similar to being out of school altogether.



Another possible relationship between achievement and exposure is shown by Curve B, which is logarithmic in form. Curve B resembles Curve A

at the end of the curve; the main difference is that rather dramatic returns are realized even for small amounts of exposure to schooling.



We have no data to explore the nature of the achievement/exposure relationship in detail. Most observations occur at the upper end where the curve flattens out. Studies based only on data at this end of the curve might properly conclude that attendance has no impact on achievement. However, it is important to note that for some part of the student population, attendance rates are so low that it becomes a definitional problem to state if they are in or out of school (Karweit, 1973). The current discussion explores the possibility that exposure and achievement may be linearly related in the observed range, but that extrapolations outside that range are likely to be invalid. Information on the returns to achievement per unit of time spent in school might suggest what the shape of the curve should be; important information to be had before dismissing attendance as a non-important factor in achievement.

A recent article in the Educational Researcher (Wiley & Harnischfeger, 1974), investigated the influence of quantity of schooling on achievement. Wiley and Harnischfeger utilized the sixth grade EEO data (at the school level) for the city of Detroit to assess the impact of quantity of schooling (percentage in attendance X hours/day X days/year) on achievement (verbal ability, reading comprehension and mathematics achievement). The authors note that quantifying exposure to schooling in this way produces large

variations in the total number of hours of schooling per year (710 to 1150 hours). They then argue that exposure should be considered as a "moderator of the effects of school characteristics" and present a hypothetical model linking student background characteristics to achievement in which exposure serves as a mediating variable.

Using the Detroit EEO data, in a school level analysis, they report the unstandardized regression coefficients for exposure (transformed to a log scale) on achievement, holding constant race, number of possessions in the home, and the number of children in the family. From this analysis they conclude that "the amount of schooling a child receives is a highly relevant factor for his achievement" (Wiley & Harnischfeger, p. 8).

Additionally, Wiley and Harnischfeger extend their conclusions to state that "in terms of typical gains in achievement over a year's period, we conclude that in schools where students receive 24 percent more schooling, they will increase their average gain in reading comprehension by two-thirds and their gains in mathematics and verbal skills by more than one-third." (p. 9). Extrapolating from this finding in Detroit they predict that due to differential exposure "pupils in Vermont on the average gained 17.1 percent less in reading comprehension than similar pupils in Maryland." (p. 9).

Because educational researchers have not found school effects of any notable size, Wiley and Harnischfeger's conclusions do seem (as they term it) "an explosion of a myth." Their finding that attendance related measures are important is even more surprising given the unimportance (nonsignificance) claimed for attendance in reanalyses of the Coleman report (Mosteller & Moynihan, pp. 277-279).

Unfortunately, the article leaves unanswered some crucial issues. For example, they form their quantity variable as the product of percent in attendance X hours in the day X days in the school year. They then take the log of this product, but do not indicate why the log transformation was carried out. Was the log transformation of the quantity variable done for substantive reasons (they assume attendance and achievement are related as in Curve B), or, was it done because of distributional problems?

Secondly, their reporting of statistical results is sparse, giving only the unstandardized regression coefficients, associated standard error and a "grade equivalence conversions of 1 score point."

More importantly, they have not indicated the rationale for the specification of the model which they used. If we are to seriously consider exposure or quantity as an important mediator between background factors and achievement, then a reasonable discussion of the adequacy of the specification of the model should be included. Wiley & Harnischfeger specify three background variables: percentage white of the school, items in the home, and family size. Is the average family size of the school viewed as tapping other important and independent sources of variation than say the average-items-in-the-home measure? This is a school level model; why are organizational features of the school not considered? If their model is intended as a preliminary specification they did not indicate so; furthermore, their generalizations would lead us to believe they do not view it as preliminary in any sense.

Because the issues addressed by Wiley and Harnischfeger are important substantive ones, we sought to replicate their analysis in several data sets.

Beginning with the records for individual sixth grade students in the Detroit Central city school system, aggregate level variables were constructed pertaining to each school. The items-in-the-home variable was constructed following the procedure utilized in the Coleman-Campbell report.* Apparently, Wiley and Harnischfeger constructed their index differently, using nine items, but did not report in their article which items they used. Consequently, our index differs from theirs. Quantity of schooling (Q) was constructed as Q = log (ADA X Days X Hours). If data were missing on any of these items, then Q was set to a missing data category and excluded in the regression. Repeating Wiley and Harnischfeger's analysis, we did find that quantity of schooling exerted a significant direct influence on achievement. Figure 1, in the left panel, contains path diagrams for this model.**

Insert Figure 1 About Here

However, when the same analysis was carried out for the rest of the schools in the Detroit area SMSA excluding the 40 central city schools, the dramatic effects reported by Wiley and Harnischfeger disappeared (direct paths -.06, -.04, -.10). Panel 2 of Figure 1 contains the path diagrams for this set of data. This finding prompted some speculation that achievement in Detroit City schools with their preponderance of minority and ethnic students might be more sensitive to differential

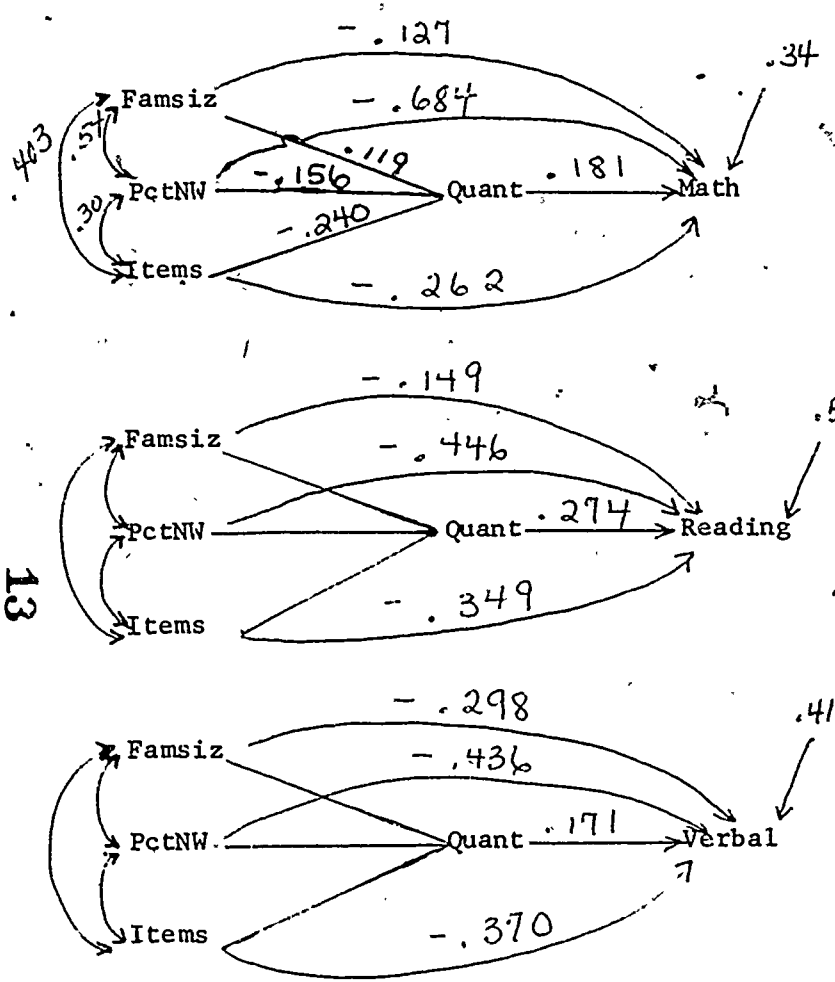
*It is a weighted combination of posessions in the home (TV, telephone, record player, refrigerator, automobile, vacuum cleaner.)

**The unstandardized coefficients obtained were 9.97, 16.44 and 9.01 for quantity on math, reading comprehension and verbal ability respectively. The standard errors were 3.32, 5.61 and 3.36. These figures do not match Wiley and Harnischfeger's, presumably due to differences in scaling on the items variable.

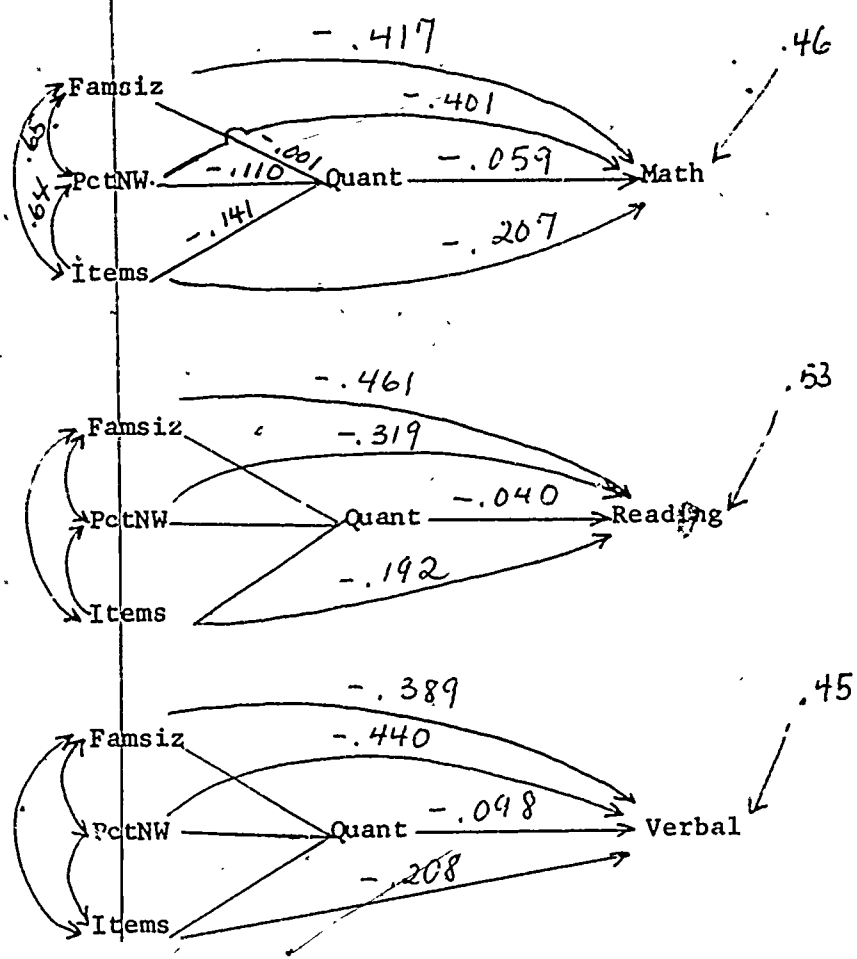
Figure 1

Detroit Area Schools-6th Grade from Coleman Report Data

City N = 40



County N = 30



attendance rates. This conjecture is consistent with the suggestions made throughout the Coleman-Campbell report that some groups (notably blacks) are differentially sensitive to the schools and their resources.

To determine if central city school systems differ in the effect of attendance on achievement we compared the following cities and their surrounding SMSAs: Washington, D.C., Milwaukee, Philadelphia, and Cleveland. Separate regressions were run for each central city and its SMSA with the central city school systems excluded. Average family size, average percent white and average items in the home were regressed on verbal ability, mathematics achievement and reading comprehension respectively. Then, the log of quantity of schooling of the school was introduced as an intervening variable between the school characteristics and the outcome variables. No clear pattern of the impact of attendance on achievement emerged from this analysis. In some cities the direct effect of quantity on achievement was large, in others it was miniscule. In several instances the number of schools became small enough to question the wisdom of the analysis. Consequently, we combined all central city school systems into one group and their surrounding SMSAs into another, and reran the regressions. In neither central city schools nor surrounding SMSAs do we find a significant improvement in prediction from the addition of quantity as a variable.

At this point, our additional analyses do not support Wiley and Harnishfeger's conclusions. This lack of evidence may indicate not that their theory is questionable, but that they have inadequately specified their model within which they explored their theory.

We will now examine Wiley and Harnishfeger's quantity theory by means of several differently specified models. Still considering the school as the unit of analysis, we first incorporated an organizational characteristic, size, which has consistently shown a positive and significant relationship with absenteeism. Additionally, the percent white of the school and the average father's education were entered as background factors.

An additional modification was made to substitute average daily attendance (ADA) as the measure of quantity of schooling. Rerunning the Detroit area data using ADA instead of quantity did not alter the results appreciably. Moreover, confusion remained as to why the log transform of quantity was utilized in the first place. If the exposure/achievement relation is assumed to be logarithmic in form at the individual level, taking the log at the aggregate level would not be justified because the aggregate average was obtained by linear averaging.

Again, combining the central cities into one group and comparing these with their surrounding SMSAs, we did not find a significant improvement in prediction from using attendance as an intervening variable in this newly specified model. Tables 1 and 2 contain the results of the regression in which size of school, percent white of school, and average father's education were regressed on verbal ability, mathematics achievement and

reading comprehension. In comparing the central city and its environs, the most interesting result is the differential importance accorded to size in explaining attendance. In central city systems, the direct effect of size on attendance is -.16 (unstandardized coefficient = -.0063) whereas in the SMSA excluding central cities, the direct path is -.01 (unstandardized coefficient = -.00039). Thus, size would appear to be an important determinant of school attendance in central city schools, but not in the surrounding SMSAs.

Insert Tables 1 and 2 About Here

Because we wished to learn if central cities differed from SMSAs in the manner in which attendance influenced achievement, the analysis thus far has been concerned only with schools in metropolitan areas. Now we turn to the question: considering all the schools in the sixth grade sample and controlling for size, urbanism of location, percentage white students and average father's education, does attendance affect achievement? The regression analysis which pertains to this question is reported in Table 3. Because there were 2361 schools, significance tests are not relevant. We will follow the usual convention of ignoring any path with a coefficient less than .10. Using this criteria, attendance is on the lower end of respectability as an explanatory variable, having paths of .10 for verbal ability and reading comprehension. For mathematics achievement the path drops to .08. Another way to look at the small influence of attendance on achievement is to note that the increment in explained variance is about one percent when attendance is added.

Insert Table 3 About Here

Table 1

Sixth Grade EEO Data

(Standardized Regression Coefficients)

Central City School Systems

N = 569

	Verbal	R C	Math	Attend
Size	-.05	-.06	-.06	-.16
Percent White	.59	.56	.65	.25
Fathers Education	.44	.40	.35	.15
R^2 =	73.5	65.6	72.1	.15
Size	-.04	-.05	-.05	
Percent White	.57	.54	.64	
Fathers Education	.42	.39	.34	
Attendance	.09	.08	.06	
R^2 =	74.2	66.1	72.5	
ΔR^2 =	.7	.5	.4	

Table 2

Sixth Grade EEO Data

SMSA Surrounding Central City

but excluding Central City

N = 495

	Verbal	R C	Math	Attend
Size	-.03	-.02	-.03	-.01
Percent White	.57	.57	.60	.26
Fathers Education	.41	.40	.38	.15
R^2 =	70.5	68.8	71.2	.13
Size	-.03	-.02	-.03	
Percent White	.55	.54	.58	
Fathers Education	.40	.38	.37	
Attend	.07	.10	.06	
R^2 =	71.0	69.8	71.5	
ΔR^2 =	.5	1.0	.3	

Table 3

Sixth Grade EEO Data

All Schools

N = 2361

	Verbal	R-G	Math	Attend
Size	-.02	-.01	-.02	-.09
Urban	.01	.01	.03	.05
Percent White	.62	.61	.64	.37
Fathers Education	.36	.34	.33	.09
R^2 =	66.8	63.9	65.0	.18
Size	-.01	.00	-.01	
Urban	.01	.02	-.03	
Percent White	.58	.57	.61	
Fathers Education	.35	.34	.32	
Attend	.10	.10	.08	
R^2 =	67.7	64.8	65.5	
ΔR^2 =	.9	.9	.5	

These results do not support claims for a large impact of attendance on achievement. Still, we have not taken into account many of the factors which influence an individual students achievement. In particular, we need to specify a model at the individual level which would take into account student ability. Considering student ability is particularly important in models which assess the impact of exposure to schooling. Previous research (for review see Stephens, 1967), has consistently shown tnat the influence of absence on grades for example is considerably diminished once ability is controlled.

The model used now will contain both individual and school level factors. An individual brings to school certain background factors which will influence achievement. The school, so to speak, operates on these background factors. We then view individual attendance as modifying the influence of the school. In determining the manner in which quantity of schooling might influence achievement, we "disaggregated" Wiley and Harnishfeger's quantity measure. Hours per day in the school and days per year in session are variables which are influenced by, for example, community factors. An individual student's attendance is seen as influenced by other sets of factors (Karweit, 1973). Thus, in this specification it would be inappropriate to use a measure which combined a diverse set of influences.

In exploring the utility of this model, two separate sets of data will be used: (1) the McDill twenty school data and, (2) the EEO twelfth grade data. For the McDill data set, a ten percent systematic sample (N = 2053) was drawn and a model specified which linked individual background characteristics and school characteristics to achievement with

attendance as a mediating variable. The hypothesized model appears below:

Student Background	→ School	→ Attendance	→ Outcomes
(Sex, Ability, Father's Education, Siblings)	(Size, Academic Emulation, days in session, hrs. per day)	(Individual % in Attendance)	(Mathematics achievement, grade point average, college plans).

We explored the utility of this model using a stage-wise regression procedure in which the variables were entered, in groups, as they appear in the above diagram. Thus, individual background factors were entered first, then school characteristics, then school attendance. Table 4 contains the results of this analysis. For Mathematics achievement, the individual background characteristics account for 51% of the variance.

Insert Table 4 About Here

These same variables (sex, ability as measured by an arithmetic reasoning test, father's education and number of siblings in the family) accounted for 19% and 13% of the variance respectively for grade point average (English) and college plans. Next, characteristics of the student body were entered and the R^2 became 53, 19 and 19 for the three dependent variables. The largest increment, for college plans, is due mainly to incorporation of the hours in the school day variable (direct path = -.06). We suspect that hours in school, which reflects whether or not the school is on double shifts, is picking up some of the variance attributable to community resources and of course student background characteristics.

Table 4

McDill Twenty School Data

N = 2053

	Math	GPA	College Plans
Sex	-.06	.28	-.02
Ar	.68	.28	.22
FaEd	.12	.11	.23
Sibs	-.04	-.10	-.11
R^2 =	51.	19.	13.
Sex	.08	.25	-.04
Ar	.66	.25	.19
FaEd	.11	.09	.21
Sibs	-.04	-.09	-.11
Acadv	.14	.26	.24
Size	.01	-.03	.01
Days	-.03	.03	.05
Hours	.01	.03	-.06
R^2 =	53.	19.	19.
Sex	-.08	.26	-.03
Ar	.65	.23	.16
FaEd	.10	.08	.20
Sibs	-.03	-.08	-.10
Acadv	.14	.25	.22
Size	.01	-.02	.01
Days	-.02	.04	.05
Hours	.01	.03	-.06
Absence	-.08	-.14	-.13
R^2 =	53.	28.	21.

Attendance was incorporated and the resulting R^2 values were 53, 28, and 21 percent. These increments to the explained variance are summarized in Table 5. Again, we find that attendance plays a modest role (direct paths of .08, .14, and .13 on math, grade point average and college plans) in influencing the dependent variables.*, **

Insert Table 5 About Here

We return now to an issue raised earlier in this paper--differential sensitivity. Although we have found that attendance has little significance for achievement, attendance may be more important for some groups of the population than for others. Specifically, along the lines of the Coleman-Campbell report, we speculated that minority students might show a greater influence for attendance on achievement than white students. To test this hypothesis, we utilized a model similar to the one specified for the McDill data set. An ability measure was not available for the EEO data, and self-report attendance data were used. Because we wished to utilize the between-school variance measures reported by Heyns (1974) the same sampling procedure (all twelfth grade students in comprehensive 9-12 high schools in the metropolitan non-south) was employed. Unfortunately we achieved a sample of 43 schools, not 48 as Heyns described in her article, thus making these published measures unusable for our purposes.

*The ordering of attendance to grade point average is questionable. More than likely, an adequate model would specify reciprocal causation between grades and attendance. For the present investigation, elaboration of this more detailed model was not carried out.

**It has been observed that non-college preparatory students have lower absentee rates than college preparatory students (Levanto, 1973). Also non-college preparatory students of the same ability attain lower grades than college preparatory students (Alexander & McDill, 1974). If differential access makes a difference in schooling outcomes then this latter finding could be a consequence of differential exposure as well as purposeful discrimination.

Table 5

McDill Twenty School Data Increments to R^2

Variables	Math	GPA	College Plans
Background	51	19	13
School	53	19	19
Attendance	53	28	21

In the twelfth grade questionnaire, students were asked: "About how many days were you absent from school last year?" Categories provided for response were (a) None, (b) 1 or 2 days, (c) 3 to 6 days, (d) 7 to 15 days, and (e) 16 or more days. Although there is no adequate reliability information for this self-report measure of absenteeism, the Coleman-Campbell report states that the self-reported attendance data for Nashville, Tennessee agreed with school record information about 80 percent of the time. This percentage is not out of line with the other information checked in the Coleman-Campbell report (Coleman-Campbell, p. 750). For the purpose of the present analysis, we will consider the data adequate.

The responses to the absentee question were coded as their category mean, with the last category being coded as 18 days. Measures of school environment and school aggregate variables were formed and then a systematic 1 in 10 sample was drawn.

Insert Tables 6 and 7 About Here

Employing reading comprehension as the dependent variable, we first determined its between-school variance. The school level reading comprehension accounted for 2.2 percent of the variance in individual scores for blacks and 2.5 percent for whites. Next, the individual factors were added to the regression (Sex, Parents' Education, Items in the home, Reading material in the home, Parents' interest in education, Belief in good luck, number of siblings in the home). Student background factors and the covariate accounted for 15.6 percent of the variance in individual students' reading comprehension for whites and 16.1 for blacks. School level

Table 6

Reading Comprehension

Regression Results for: Twelfth Grade EEO Data

Non-Whites N = 361

	1	2	3	4
RC*	.15 (.60)	.11 (.44)	.18 (.72)	.17 (.67)
Sex		-.03 (-1.16)	-.04 (-1.40)	-.04 (-1.38)
Siblings		-.07 (-.51)	-.07 (-.51)	-.07 (-.53)
Parent's Education		-.07 (.49)	.07 (.48)	..07 (.44)
Items in the home		-.05 (-.79)	-.04 (-.60)	-.03 (-.42)
Reading Material		-.09 (-.97)	-.09 (-.95)	-.09 (-.99)
Parental Interest		.08 (.69)	.07 (.62)	.05 (.46)
Gook Luck		.27 (7.49)	.27 (7.21)	.27 (7.23)
School Size			-.05 (-.01)	-.04 (-.01)
Percent White			-.15 (-.08)	-.15 (-.08)
Individual Absence				-.15 (-.19)

≠ Non-Standardized betas are in parentheses

* Average Reading Comprehension of School

Table 7

Reading Comprehension

Regression Results for Twelfth Grade EEO Data

Whites N = 955

	1	2	3	4
RC*		.16 (.61)	.19 (.70)	.19 (.72)
Sex		.08 (2.81)	.07 (2.69)	.08 (2.87)
Siblings		.01 (.08)	.01 (.07)	.01 (.01)
Parents Education		.13 (.81)	.13 (.81)	.13 (.82)
Items in Home		-.04 (-.91)	-.04 (-.99)	-.03 (-.81)
Reading Material		-.06 (-.79)	-.05 (-.79)	-.05 (-.71)
Parental Interest		.04 (.33)	.03 (.31)	.03 (.29)
Good luck		.24 (8.23)	.23 (8.23)	.23 (8.16)
School Size			.00 (.00)	.01 (.00)
Percent White			-.05 (-.05)	-.05 (-.05)
Individual Absence				-.08 (-.15)

*Average Reading Comprehension of School

≠ Non-standardized betas are in parentheses

characteristics (size and percent white students), when added to those variables already in the equation, raised the R^2 to 15.8 percent for whites, and 18.6 for blacks. Individual days absent, posed as a mediating variable to between-school and student factors, brought the variance explained up to 16.4 percent for whites and 20.8 percent for blacks. We do note a larger influence of attendance on achievement for blacks as compared to whites, but the effect is still modest in size. Table 8 summarizes the increments to R^2 for blacks and whites.

Insert Table 8 About Here

Summary

Recent evidence has held that schools do not exert much of a differential impact on their students. This conclusion is based on analyses which used school averages as individual measures of utilization of school resources. In this paper, a model linking individual background factors, school features and achievement outcomes was specified, and then differential access to school as measured by attendance, was incorporated. Various versions of the model were tried for both individual and school level populations for three data sets. In general, attendance was found to have a minor impact on achievement. Separate analyses were carried out for white and non-white students to test the possibility that non-white achievement scores are more sensitive to the influence of school attendance. Controlling for individual and school factors, our results indicate that attendance is in fact more important, but not significantly so, for non-whites than whites. Whether this finding is due to our failure to completely specify the model remains to be shown in future work. For the present investigations, background factors and school factors which have

Table 8

Increments to R^2

Twelfth Grade EEO Data

	Non-Whites	Whites
RC	2.2	
Background Variables	16.1	15.6
School Variables	18.6	15.8
Individual Absence	20.8	16.4

previously been incorporated in achievement models were entered prior to the attendance variable in an attempt to insure that attendance would not be "masquerading" as some other variable in disguise. Our measures of attendance, in at least one of the data sets, were of questionable reliability. Treating attendance and access as equivalent may also be problematic, as a present student could be blocked from utilizing resources, and an absent student could still utilize school resources. However, the present analysis is a preliminary attempt to introduce some variation into the measurement of school effects, a procedure which seems reasonable before concluding that schools "make no difference."

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Appendix

Description of Data Set

A. Equality of Educational Opportunity Data (Coleman-Campbell)

1. Sixth grade

   All schools in the sixth grade for which complete principal and student data were available were utilized. This resulted in 2,361 schools which were used in a school level analysis.

2. Twelfth grade

   All comprehensive high schools in the metropolitan non-South which had both grades 9 and 12 and data from their principal were employed in this sample. This sample corresponds to the one used by Heyns, (1974)

B. McDill Twenty High School Data

1. A ten percent systematic sample of the 20,035 students in the original data set was drawn. For details of the original study, design and results, one may consult McDill and Rigsby (1972), McDill, Rigsby and Meyers (1969).

Variables

A. Equality of Educational Opportunity Data (EEO)

1. Dependent Variables

   a. Verbal Ability
   b. Reading Comprehension
   c. Mathematics Achievement
   d. Educational Aspirations

2. Independent Variables

   a. Race: White = 0, Non-White = 1
   b. Sex: Male = 0, Female = 1
   c. Siblings: Actual number in family from 1-10.
   d. Parents' Education: Sum of score for mother and father with range from 00-16, low to high.

e. Items in the home: Presence scored as 1, absence scored as 2 for the following items: refrigerator, television, telephone, vacuum cleaner, automobile, radio.

f. Reading material in the home: A combination of presence of dictionary, encyclopedia, daily paper, number of magazines and books in the home scored such that a high value indicates lack of items and a low value indicates presence of items.

g. Parent's Interest in education: A combination of questions concerning frequency of parental talks about school and frequency of being read to prior to entering school. Scored so that high interest corresponds to a high value.

h. Good luck: Questionnaire item number 102, "Good luck is more important than hard work for success" scored as disagree, not sure, agree, with values 1-3.

i. Size: Size of school.

j. Percent white: Percent white of the student body.

k. Absence: Recorded category means of student self-report item. (Coding specifications on page 21.)

B. McDill Data Set

1. Dependent Variables

a. Grade Point Average: English grade point average.

b. Mathematics Achievement: Project Talent twenty-four item multiple choice test.

c. College Plans: Dummy variable relating college plans with yes coded 1 and no coded 0.

2. Independent Variables

a. Father's Education: A seven category education variable was contained on the student questionnaire. Responses ranged from "some grade school" to "attended graduate school or professional school after college."

b. Arithmetic Reasoning: Project Talent fifteen item multiple choice test which was designed to test reasoning ability.

c. Sex: Female = 1, male = 0.

d. Siblings: the number of children in the family.

e. Size: the number of students in the school.

f. Academic Value System: A summated binary rating of students' academic commitment which combines responses to how a student would use a free hour in school, how wished to be remembered in school, how important it was to receive good grades, how satisfying to work hard on studies, how much admire bright students, how important it was to learn as much as possible in school.

g. Absence: Percentage absent as obtained from school records for the preceeding year.